

**IMPROVED FUEL FOR A ZINC-BASED FUEL CELL AND REGENERATION
THEREOF**

ABSTRACT OF THE DISCLOSURE

Improved fuel compositions have improved flow properties for use in zinc/air
5 (oxygen) fuel cell systems. In some embodiments, an improved fuel composition comprises a
collection of particles having zinc and at least one non-zinc metal having improved physical
properties such as narrower particle size distributions and improved morphology. In one
embodiment, the fuel composition comprising the improved collection of metal particles can
be generated by applying an external EMF to a fuel regeneration solution. An improved
10 regeneration solution can comprise an electrolyte, zincate ions and at least one non-zinc
metal. Due to the presence of the non-zinc metal, and other additives, in the regeneration
solution, the improved regeneration solution can be used to generate an improved fuel
composition comprising a collection of particles having zinc and at least one non-zinc metal.